REMARKS

Applicant affirms the provisional election made with traverse on November 14, 2001 to prosecute the invention of Examiner's Group I, claims 1 – 18.

Applicant believes that the inventions of Examiner's Groups I and II are related at least to the extent that practice of forms of the method results in the fiber reinforced article or member. In that regard, it should be noted that 35 U.S.C. 121 intentionally gives the Examiner discretion in applying the requirement for restriction or election through use of the phrase "may require the application to be restricted to one or more inventions" (emphasis added).

Because of the close relationship between the subject matter of both Groups of claims, it is believed that, irrespective of the traditional different classifications of the claims in each Group, substantially the same fields of search would be required to evaluate fully the claims of both Groups. Therefore, it is believed that it would be more efficient and less time consuming to prosecute together both Groups of claims, improving PTO efficiency in saved time and effort. In addition, in the event claims in both Groups are determined to include patentable subject matter, the public would be spared the effort of evaluating two separate patents. Therefore, it is respectfully requested that the Examiner exercise the discretion provided in 35 U.S.C. 121, and reconsider and withdraw the requirement for restriction.

Claims 1 – 18 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for the reasons stated by the Examiner. Claims 1 and 13 have been amended, responsive to the subject matter pointed out by the Examiner and consistent with the specification, to more clearly point out and distinctly claim the present invention.

More specifically in regard to the present claims, including claims 1 and 13, the present invention has been described in more detail in connection with an embodiment of a turbine engine article or member. Throughout the present specification, as well as in the Parthasarathy et al reference discussed below, use of terms relating to operation in connection with such an article or member means "use", as is well known and referred to in the art. It is well known that during such use, the member or article experiences, or is

subjected, concurrently to a plurality of combinations of operating temperatures and stresses as the engine traverses a cycle of use from start-up to shut down

To clarify that such action on a member or article means use and is not a part of a process step, claims 1 and 13 have been amended to recite that the article or member is subjected during operation use to concurrently applied temperatures and stresses. It is well known in the art that such temperatures and stresses can vary, and are measured, under a variety of operating use conditions, for example from initiation of operation of a turbine engine through the various cycles during its operation. That is how an article or member experiences or is subjected to a plurality of temperatures and stresses during operating use.

The claims presently under consideration depend from either of generic claims 1 and 13. Such generic claims have been amended, consistent with the specification including the drawings, to clarify the meaning of the term "regions". Regions, as used and defined throughout the present specification and clearly shown in and in connection with the drawings, means discrete, distinct regions each extending within and through the article or member from one external surface to another opposed external surface. Each discrete region is identified on an external surface by a surface area A, the identified regions together defining a total external surface area T of that surface of the article or member. The present specification starting on page 1, line 9 through page 2 line 2, and repeatedly throughout the description and drawings supports that definition of a region. Accordingly, the claims have been amended to recite that definition of a region.

The Examiner has stated that it is unclear how the fibers have a strength greater than the stress and whether the measurement units would be the same. According to forms of the present invention, the fibers are selected to have such a property. The specification includes a description of one form of a relationship for determining the relative stresses in and strengths required for compensating for stresses in regions. For example, such description is included on page 2, line 18 through page 3, line 9; on page 6, lines 12 through page 7, line 14; etc. Stresses in a region and strengths of fibers can be measured by various well-known instruments, including strain gauges and commonly

used, commercial tensile strength testing apparatus. Typically, they are compared in the same units. In the examples on page 6, line 22 through page 7, line 14, such same unit for stresses and strengths are presented as pounds per square inch (psi). Generally, specification sheets provided by a fiber manufacture, for example by 3M Company for Nextel 610 and Nextel 720 materials or rovings, include typical product properties including filament tensile strength in psi or ksi (thousands of pounds per square inch). Therefore, the same measurement unit for operating use stresses and for fiber strength are easily and commonly determined for appropriate selection according to forms of the present invention.

In connection with claims 1, 3 and 13, the Examiner has stated that it is unclear what kind of stress that the fibers undergo. Stresses generated on turbine engine components during operation use are well known and considered in the design of such apparatus. Applicant first refers to such stresses on page 1, line 9 through page 2, line 2, and elsewhere throughout the specification. The wide variations and differentials in operating temperatures and forces, for example resulting from rotation and/or fluid flow pressures on an article or member during use in certain power generating apparatus as a turbine engine, generates stresses or strain in such component and, in turn, on fibers within a fiber reinforced component. As is discussed, the uncompensated stress conflict between fibers in different temperature regions can result in undesirable deterioration through the component, for example cracking between opposing surfaces within and through weaker regions. Forms of the present invention resolve such conflict by a particular selection of fibers in a plurality of regions through an article, interrelated and responsive to operating use conditions throughout the component.

Applicant has amended the claims under consideration, as supported by the specification, and provided full explanations to overcome any indistinct or misunderstood subject matter in the claims. It is respectfully requested that the Examiner reconsider and withdraw all rejections of claims 1 – 18 under 35 U.S.C. 112.

Claims 1, 2, 4, 6, 8 –10, 13 – 14, 16, and 18 were rejected under 35 U.S.C. 102(b) as being anticipated by Parthasarathy et al., U.S. Patent No. 6,251,815 B1 for the reasons presented by the Examiner.

The reference relates generally to a fiber reinforced composite structure, using materials similar to those presented as examples in the present specification. However, as an article or member, for use in whatever apparatus, the structure of the article of the reference is of a completely different kind than that defined by forms of the present invention. The reference teaches a structure with different opposing surfaces responsive to different temperatures to which each surface is exposed. A "region" is defined by the reference as an external surface region, or a stack of laminations along a surface of an article, separated by a thickness of the article from an opposing external surface region, for example a hot operating side region and an opposite cool operating side region. Fibers for such opposed surface regions are selected to compensate for differences in thermal expansion characteristics between the surfaces.

In contrast according to forms of the present invention, an article or member comprises a plurality of discrete, individual "regions" defined as being not only on a surface but also each region extending through and within such component. The "regions" of embodiments of the present invention together define the component, for example as juxtaposed, adjacent pieces of a jig-saw puzzle, not merely external or a stack of component laminations generally along surfaces of the component, as in the reference. Therefore, each "region" as defined by the present invention structurally extends within and through the article or member between opposing surface. Such a structure is not remotely suggested or implied by the reference.

For all of the above reasons, it is believed that Parthasarathy et al. cannot anticipate the structure defined by the rejected claims. It is respectfully requested that the Examiner reconsider and withdraw this rejection under 35 U.S.C 102(b).

Claims 1, 3, 5, 7, 11 – 12, 15, and 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Parthasarathy et al., U.S. Patent No. 6,251,815 B1 for the reasons stated by the Examiner.

The above evaluation and characterization of that reference is repeated here in connection with this rejection. For all of those reasons, the invention of the rejected claims is patentable over that reference.

Even though the reference describes use of similar materials for similar apparatus in connection with which the present invention has been described as an example, the above differences in kinds of structures remain the same. There is nothing remotely in that reference to suggest to one of ordinary skill in the arts involved to change a "region" as defined by the reference to a different kind of "region" as defined in connection with embodiments of the present invention. There is nothing in the reference to suggest changing a structure laminated generally along surfaces, to a structure of interconnected, juxtaposed adjacent pieces or "regions", each extending through and within the structure from one opposed surface to another.

In respect to dependent claims 3 and 15, that reference does not remotely suggest, and it would not be obvious or remotely possible from the disclosure of that reference, to determine such a relationship to enable selection of fibers for such a different kind of structure.

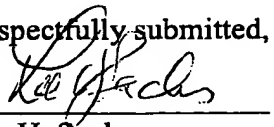
Applicant on page 7, lines 22 – 30 defines reasons for selecting a range for volume % of fibers in a "region", as that term is defined in connection with the present invention, in one preferred embodiment of the present invention. That preferred embodiment of the generic invention, at least deriving novelty from and represented at least by claims 1 and 13, is represented in dependent claims 7, 11, and 12. Discussion in the reference of relative amounts of fibers relate to amounts in adjacent layers or laminations for the purpose of thermal expansion transition between layers, not in respect to adequate reinforcement or matrix integrity, as with those embodiments of the present invention. There is nothing in that reference to remotely suggest applicant's preferred embodiment of the invention for those reasons.

Applicant has shown the embodiments of the invention represented by the claims subject to this rejection are patentable over the cited art. It is respectfully requested that

the Examiner reconsider and withdraw this rejection of claims 1, 3, 5, 7, 11 – 12, 15, and 17.

Applicant has amended the claims and presented arguments and reasons why the requirement for election/restriction can and should be withdrawn, and to overcome rejections under 35 U.S.C. 112, under 35 U.S.C. 102(b), and under 35 U.S.C. 103(a). It is respectfully requested that the Examiner reconsider and withdraw the requirement for election/restriction and all rejections of the claims.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 1 and 13 as follows:

1. (amended) A fiber reinforced composite article comprising a matrix and reinforcing fibers, the article during operation use subjected [experiencing] concurrently in the article to a plurality of operating temperatures and stresses, varying between a plurality of discrete regions [of] across, within and through the article between opposing surfaces, each region identified by a surface area A, the regions together defining a total area T of the surface of the article;

a first region of the article during operation use subjected to [experiencing] a first temperature and a first stress, and including first fibers having a first strength greater than the first stress; and,

a second region of the article during operation use subjected to [experiencing] a second temperature less than the first temperature and a second stress greater than the first stress, and including second fibers having a second strength greater than the second stress.

13. (twice amended) A member comprising reinforcing fibers for reinforcement of a fiber reinforced composite article, the member during operation use subjected [experiencing] concurrently in the member to a plurality of operating temperatures and stresses, varying between a plurality of discrete regions [of] across, within and through the member between opposing surfaces, each region identified by a surface area A, the regions together defining a total area T of the surface of the member;

a first region of the member during operation use subjected to [experiencing] a first temperature and a first stress, and including first fibers having a first strength greater than the first stress; and,

a second region of the member during operation use subjected to [experiencing] a second temperature less than the first temperature and a second stress greater than the first stress, and including second fibers having a second strength greater than the second stress.